

REMARKS

Reconsideration and allowance are respectfully requested.

Remarks Regarding Claim Amendments:

Claims 1, 6, 7, 8, 13 and 16 are amended to correct typographical errors and to more clearly define the invention according to the Examiner's suggestions. The amendments are fully supported by the original disclosure and, thus, no new matter is added by their entry. It is noted that the claim amendments are being made to correct informalities and conform to U.S. practice; they are not required for patentability.

Remarks Regarding Section 112:

Claims 1-16 stand rejected under 35 U.S.C. § 112 second paragraph as allegedly indefinite. Applicants traverse. The Office Action listed a number of alleged indefiniteness issues with respect to the claim language. Each of these indefiniteness issues is addressed below:

Claim 1: It is alleged that the terms "phosphinimine ligand," "R^{1J}" and "R^{2J}" are improperly used and/or are improperly formatted. Applicants have amended claim 1 to more clearly define the invention and/or reformatted the terms.

Claim 6: It is alleged that the terms "or," "a carboxylate" and "their alkoxide or phenoxide" is vague or improperly used. The terms "or" and "a carboxylate" have been deleted. The phrase "their alkoxide or phenoxide" have been replaced with "alkoxide or phenoxides of the phosphate ester."

Claim 16: It is alleged that the phrase "in the presence of between 5 and 10 equivalents of imine ligand according to formula 1" is indefinite because it was unclear. Applicants have amended claim 16 to recite that the 5 to 10 equivalents refers to phosphinimine ligand compounds.

Applicants request withdrawal of the Section 112, second paragraph, rejection because the pending claims are clear and definite.

Claims 13-16 stand rejected under 35 U.S.C. § 112 first paragraph as allegedly not enabling. Applicants traverse. Specifically, the Office Action alleged that the claims are not enabled for the preparation of a polyolefin without a catalyst. Applicants have amended claim 13 to recite that a polyolefin is made by polymerizing an olefin monomer in the presence of a metal-organic compound made according to the process of claim 1. Since amended claim 13 claim now recites that the polyolefin is made with a metal-organic compound, this rejection is moot and should be withdrawn for claims 13 and claims dependent thereon (i.e., claims 14-16) since these dependent claims incorporate the recitation of claim 13 by nature of their dependency.

Applicants request withdrawal of the Section 112 first paragraph rejection because the pending claims are clearly enabled.

Remarks Regarding Section 103:

Claims 1-5, 8, 9, 11, 13-16 stand rejected under 35 U.S.C. § 103 as allegedly obvious in view of von Haken Spence (U.S. Patent 6,355,744) Gao (Canadian Patent 2,261,518) and Nielsen (U.S. Patent Publication (20040010142). Applicants traverse.

The Examiner states that it would have been obvious for a skilled artisan to employ Gao's aminophosphonium halide to von Haken Spence's phosphinimine ligand containing metal-organic compound preparation process. The examiner further notes that the aminophosphonium salt can be neutralized with a strong base such as NaOH, NaOMe and BuLi as described on page 3 of Gao. The use of NaOH and NaOMe may appear to provide the phosphinimine in first instance. However, Applicants urge the Examiner to consider the fact that the use of MeOH is generally known to hydrolyze the phosphinimine to the thermodynamically more stable and undesired phosphinoxide under liberation of MeNH₂ (enclosed document: Hawkeswood et al., Dalton Trans. 2182-87, 84 (2005), second reaction in scheme 2). Therefore, similar hydrolyzing reactions may be expected when NaOH and NaOMe are used to neutralize the aminophosphonium salt.

Applicants submit Grob (enclosed document: Grob et al., 626 Zeitschrift fuer Anorganische und allgemeine Chemie 1065-72 (2000)) for the Examiner's

consideration. Grob, states that strong bases have to be extremely pure to prevent hydrolysis of phosphinimine. Further, Grob indicates that KNPPH₃ can only be made in an extremely dry environment (Grob, page 1071). Mixtures that contain phosphinoxide are difficult to purify. In particular, BuLi is a very strong base that complicates selective formation of the NH-phosphinimine caused by deprotonation of the NH-phosphinimine to the NLi-phosphinimide, resulting again in separation problems. For the reasons stated above, the skilled artisan would therefore not employ Gao's aminophosphonium halide to Van Haken Spence's phosphinimine ligand containing metal organic compound preparation process since the literature teaches against such an approach.

Furthermore, the Office Action's argument is based on the assumption that triethylamine is a stronger base than Y=N-H so that one would expect that triethylamine would react with aminophosphonium halide to form phosphinimine and (Et₃NH)⁺Cl⁻. Applicants respectfully disagree with this line of reasoning. In fact, Clayden (enclosed document: Clayden et al., Organic Chemistry, Clayden, Greeves, Warren and Wothers, Oxford University Press 2001) indicates the opposite of the Office Action's assumption, as can be derived from the pK values of Et₃N (10.8, page 199) and guanidine (13.6 page 202). The pK value of guanidine is conservatively chosen as this is the lowest pK of the guanidine family. When substituted, the pK of the guanidine increases analogous to substitution of ammonia (pK increases from 9 to 11, p. 198-99). The value of the used phosphinimines is comparable to that of substituted guanidines since these are isoelectronic. Because of this, a skilled artisan would not have expected that triethylamine to react with aminophosphonium halide to form phosphinimine and (Et₃NH)⁺Cl⁻.

The observation of the Examiner that alkyl lithium and alkyl magnesium halide are functionally equivalent as described in Nielsen cannot be applied in the completely different process of the invention. From Claydon, it can be learned that the direction of a reaction strongly depends on the pK values of the reactive components. It was therefore not obvious for a skilled artisan to employ Gao's aminophosphonium halide to von Haken Spence's phosphinimine ligand containing metal-organic compound preparation process.

Withdrawal of the Section 103 rejections is requested because the claims would not have been obvious to one of ordinarily skill in the art when this invention was made.

Remarks Regarding Allowable Subject Matter:

Applicants note, with appreciation, that the Examiner has acknowledged that claims 6, 7, 10 and 12 contain allowable subject matter.

Conclusion

Having fully responded to the pending Office Action, Applicants submit that the claims are in condition for allowance and earnestly solicit an early Notice to that effect. The Examiner is invited to contact the undersigned if additional information is required.

Respectfully submitted,

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